



P.V.G.'s
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Terminal Examination (2025-26)
Standard - XII

Subject : Physics

Marks : 50

Date : 14.10.2025

Time : 8.30 am to 11.00 am

- Note -
- 1) All sections are compulsory.
 - 2) All symbols have their usual meaning unless and otherwise stated.
 - 3) Figures to the right indicate full marks.
 - 4) Draw the diagrams wherever necessary.
 - 5) Use of logtable is allowed. Calculator is not allowed.
 - 6) For each MCQ, correct answer must be written along with its alphabet.
- Only first attempt will be considered for evaluation.

SECTION - A

(14)

Q1. Select and write the most appropriate answer from the given alternatives for each subquestion. **(7)**

- i) The displacement of a particle performing linear harmonic motion in one time period is _____.
 - a) A
 - b) 2A
 - c) Zero
 - d) 4A
- ii) The linear velocity of electron is proportional to _____.
 - a) n
 - b) n^2
 - c) $1/n$
 - d) $1/n^2$
- iii) If the current flowing in a circular loop is in anticlockwise direction, then the magnetic induction will be _____.
 - a) along the direction of current.
 - b) opposite to the direction of current.
 - c) directed inward.
 - d) directed outward.
- iv) The law of conservation of energy holds for _____.
 - a) Ohm's law
 - b) Kirchhoff's current law
 - c) Wien's law
 - d) Kirchhoff's voltage law

- Q2. Answer in one sentence. (7)**

- SECTION - B** **(16)**

Q3. Obtain the differential equation of linear simple harmonic motion.

Q4. State first and second postulate of Bohr's atomic model.

Q5. Write any two applications of Bernoulli's equation.

- Q6.** Write a formula for linear acceleration and speed for a rigid object of mass 'M' and radius 'R' rolling down an inclined plane without slipping.
- Q7.** Show that magnet vibrating in uniform magnetic field performs angular simple harmonic motion.
- Q8.** State any two factors affecting the angle of contact.
- Q9.** Draw a neat labelled circuit diagram of typical transistor amplifier circuit.
- Q10.** Calculate the work done in blowing a soap bubble of radius 0.1 cm, the surface tension of a soap solution is 2.5×10^{-2} N/m.
- Q11.** Calculate the series limit of Balmer series. ($R_H = 1.097 \times 10^7 \text{m}^{-1}$)
- Q12.** The speed of particles performing linear simple harmonic motion are 8 cm/s and 6 cm/s at respective displacements of 6 cm and 8 cm. Find its amplitude.
- Q13.** A motor cyclist (to be treated as a point mass) is to undertake horizontal circles inside the cylindrical wall of a well of inner radius 4m. Coefficient of static friction between the tyres and the wall is 0.4. Calculate the minimum speed and frequency necessary to perform this stunt. (Using $g = 10 \text{m/s}^2$)

SECTION C

Attempt any Four

(12)

- Q14.** With the neat labelled diagram explain the working of full wave rectifier. Draw necessary wave-forms.
- Q15.** State and prove the law of conservation of angular momentum.
- Q16.** Derive an expression for equation of stationary wave on a stretched string. Show that the distance between two successive nodes or antinodes is $\lambda / 2$.
- Q17.** Derive an expression for law of radioactive decay. Define one becquerel.
- Q18.** Two tuning forks having frequencies 320Hz and 340 Hz are sounded together to produce sound waves. The velocity of sound in air is 340 m/s. Find the difference in wavelength of these waves.
- Q19.** The emf of a cell is balanced by a length of 120 cm of potentiometer wire; when the cell is shunted by resistance of 10Ω , the balancing length is reduced by 20 cm. Find the internal resistance of the cell.

SECTION - D

Attempt any Two.

(8)

- Q20.** State modification necessary to convert a moving coil galvanometer (MCG) into an ammeter. Hence with the help of neat circuit diagram obtain an expression for shunt resistance. **(4)**
- Q21.** State formula for Ampere's law. Hence obtain an expression for magnetic field produced by solenoid. **(4)**
- Q22. a)** Obtain an expression for practical determination of the end correction for a pipe open at both ends. **(2)**
- b)** Magnetic field at a distance 2.4 cm from a long straight wire is 16 μT . What must be current through the wire? **(2)**
- ($\mu_0 = 4\pi \times 10^{-7} \text{ Wb / Am}$)
- Q23. a)** Using Newton's law of viscosity for streamline flow, derive an expression for coefficient of viscosity. **(2)**
- b)** A 5V stabilized power supply is required to be designed using a 12 V DC power supply as input source. The maximum power rating P_z of the zenner diode is 2W. Calculate the maximum current flowing through the zener diode. **(2)**

